

International Agreements for the Unification (*a*) of Craniometric and Cephalometric measurements, (*b*) of Anthropometric measure- ments to be made on the living subject

Translation of the official versions of the Reports of
the Commissions appointed by the XIIIth and XIVth
International Congresses of Prehistoric Anthropology
and Archaeology (1906 and 1912 respectively)

BY

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(a)

THE INTERNATIONAL AGREEMENT FOR THE UNIFICATION OF CRANIOMETRIC AND CEPHALOMETRIC MEASUREMENTS.

Report of the Commission appointed by the XIIIth International Congress of Prehistoric Anthropology and Archaeology, at Monaco (1906).

[The official text was published in the *Compte rendu* of the XIIIth International Congress (1906), and also in *l'Anthropologie*, Tome xvii, No. 5, 1906, by Dr G. Papillault, Recorder of the International Commission.]

INTRODUCTION*.

THE proposal to unify anthropological measurements was made in the first instance by Messieurs Hamy, Papillault and Verneau (of Paris). On the occasion of the Opening Session of the International Congress of Prehistoric Anthropology and Archaeology at Monaco, on April 16, 1906, M. Hamy, President of the Congress, proposed the nomination of an International Commission for the purpose of giving effect to this desire. The proposal having been accepted by the Congress, a Commission was appointed forthwith. The following members of the Congress were nominated:

Messieurs GIUFFRIDA-RUGGERI (Rome).

HAMY (Paris).

G. HERVÉ (Paris).

LISSAUER (Berlin).

VON LUSCHAN (Berlin).

PAPILLAUT (Paris).

PITTARD (Geneva).

POZZI (Paris).

G. SERGI (Rome).

VERNEAU (Paris).

WALDEYER (Berlin).

* The official publication comprises a long introductory section, much of which possesses an historical interest only. This section has been abridged appropriately to the object of the present translation. Permission to reproduce the original illustrations has been courteously accorded by Professor R. Verneau. W. L. H. D.

The Commission proceeded to nominate the following officers :

President : Professor Waldeyer.

Vice-President : Professor Sergi.

Recorder : Dr Papillault.

On the proposal of the President, it was resolved that the Commission should confine its work to craniometric and cephalometric measurements, the consideration of these alone being sufficient to occupy all the time available during the XIIIth Congress. The Recorder was instructed to submit in his report to the Commission, the exact definition and technique of each measurement adopted, in order that these might be finally approved.

The Commission sat at intervals between April 16 and April 21, 1906. At the concluding meeting of the Congress, the Recorder of the Commission announced that the final report of the Commission was accessible to members of the Congress. At the same meeting, the Congress adopted *unanimously* the text of the report, which was submitted for that purpose by the President (Dr Hamy).

PROPOSED INTERNATIONAL AGREEMENT UPON CRANIOMETRIC AND CEPHALOMETRIC MEASUREMENTS.

PRELIMINARY REMARKS.

1. The Commission has qualified with the title "facultative," certain measurements which appear to be of interest, but which lack documentary evidence sufficient to confirm their value or to justify the recommendation of their employment. The methods of making these measurements have been defined therefore without a final pronouncement as to their adoption.

2. To each measurement described there is appended an abbreviated account of the instrument to be used. The abbreviations employed are as follows :

C.G. Compas glissière (example : Flower's callipers).

C.E. Compas d'épaisseur (example : Martin's callipers).

R.M. A flexible measure, composed of pliable but non-extensible material. Linen which has been slightly sized is one of the best materials employed for this purpose. It is indispensable to compare the flexible measure frequently with a metal standard.

DETAILED DEFINITIONS OF THE MEASUREMENTS APPROVED BY THE COMMISSION AND THE CONGRESS.

I. CRANIOMETRY.

A. *The Skull.*

1. *Maximum length, or maximum antero-posterior diameter of the skull.* **C.E.** The longest diameter in the median sagittal plane of the cranium: anatomical landmarks:

- (i) in front: the most projecting point of the prominence between the brow-ridges (Broca's *glabella*).
- (ii) behind: the point on the supra-occipital (? interparietal: Translator) part of the occipital bone, shewn by the separation of the calliper-limbs to be that furthest removed from the *glabella*.

2. *Antero-posterior diameter measured to the inion.* **C.E.** (facultative). The measurement is made in the median sagittal plane of the skull. Anatomical landmarks:

in front: the same as in the preceding instance (No. 1).

behind: the inion, making allowance for individual variations.

3. *Maximum width, or maximum transverse diameter of the cranium.* **C.E.** The maximum transverse diameter in a horizontal plane. Anatomical landmarks: these are determined solely by the maximum diameter: but the measurement is not to be made on the level of the infra-temporal crests*, but above these.

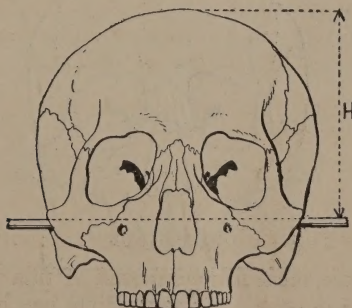


Fig. 1.

* This refers probably to the supra-mastoid crests of English anatomists.

4. *Measurements of cranial height.*(a) *Basi-bregmatic*. **C.E.**: anatomical landmarks:

- (i) the *basion*, or median point on the anterior margin of the foramen magnum (neglecting the exostoses sometimes found in this region).
- (ii) the *bregma*, or median point of the coronal suture.

(b) *Auriculo-bregmatic* (*H*, Fig. 1): the difference in level between the *bregma* and the **upper border** of the auditory aperture: anatomical landmarks:

- (i) above: the *bregma*.
- (ii) below: the point at which an imaginary line, drawn between the upper borders of the auditory aperture, cuts the median plane of the skull.

[NOTE BY TRANSLATOR. No instrument is specially recommended in the original text: an auricular radiometer of the type of Pearson's head-spanner is applicable: it is important to ensure that the reading is taken from the *upper border* of the auditory aperture and *not* from its centre.]

5. *Minimum frontal width or diameter*. **C.G.** The shortest horizontal diameter between the temporal crests on the frontal bone.

6. *Maximum frontal width or diameter*. **C.G.** The greatest horizontal diameter of the frontal squama. (N.B. The bistephanic diameter of Broca is abandoned.)

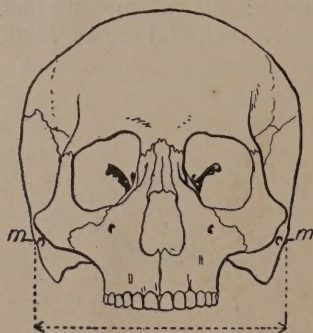


Fig. 2.

7. *Maximum bimastoid diameter*. **C.E.** (Fig. 2, *m.m.*): anatomical landmark: external aspect of the mastoid process at the

level of the centre of the auditory aperture. The greatest transverse diameter of the skull is to be measured at this level.

8. *Bizygomatic diameter*. **C.G.**: anatomical landmark: external aspect of the zygomatic arch: the maximum diameter is to be measured.

9. *Naso-basilar or basi-nasal diameter*. **C.E.**: anatomical landmarks:

(i) in front: the *nasion* (the mid-point of the naso-frontal suture).

(ii) behind: the *basion*.

10. *Alveolo-basilar or basi-alveolar diameter*. **C.G.**: anatomical landmarks:

(i) in front: the alveolar point, or *prosthion* (the mid-point of the anterior border of the alveolar arcade).

(ii) behind: the *basion*.

11. *Naso-mental diameter*. **C.G.**: anatomical landmarks:

(i) above: the *nasion*.

(ii) below: the lower border of the mandible, in the median plane.

The mandible is to be fitted to the skull, care being taken to note the condition of the teeth.

12. *Naso-alveolar diameter*. **C.G.**: anatomical landmarks:

(i) above: the *nasion*.

(ii) below: the lowest point on the alveolar arcade, between the two upper median incisor teeth. (This point is to be distinguished from the *prosthion* described above, and with which it is not identical. Translator.)

12a. *The facial index*. This is derived from the expression

$$\frac{\text{naso-alveolar diameter} \times 100}{\text{bizygomatic diameter}}.$$

13. *Nasal height*. **C.G.** (*N*, *E*, Fig. 3): anatomical landmarks:

(i) above: the *nasion*.

(ii) below: the point in the median sagittal plane of the skull, on the line tangential to the two notches of the pyriform aperture of the nose. If the margins

of these notches are occupied by grooves, then the level of the nasal floor is to be taken.

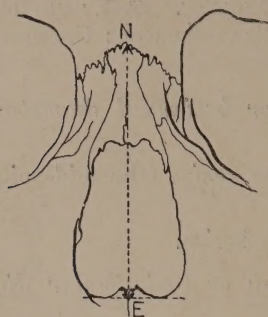


Fig. 3.

14. *Nasal width*. **C.G.**: anatomical landmarks: lateral margins of the apertura pyriformis nasi. The maximum horizontal and transverse diameters are to be measured.

15. *Interorbital diameter*. **C.G.**: bilateral anatomical landmark: the point at which the posterior lachrymal crest meets the inferior border of the frontal bone.

16. *Orbital width*. **C.G.**: anatomical landmarks:

- (i) internally: the *dacryon*, i.e. the point of confluence of the sutures formed between the lachrymal and frontal bones, and the nasal process of the superior maxilla. (If the *dacryon* is not recognizable thus, owing to synostosis, then the selected point is that where the posterior lachrymal crest meets the inferior margin of the frontal bone.)
- (ii) externally: the outer margin of the orbital aperture, where it is crossed by an axis drawn from the internal point and carried thence outwards as nearly as possible parallel to the upper and lower orbital margins.

17. *Orbital height*. **C.G.**: anatomical landmarks: the upper and lower orbital margins, avoiding any notches that may be present either above or below. The maximum vertical diameter is to be measured, in a direction perpendicular to the line of the orbital width No. 16 (*q.v.*).

18. *Width of the superior alveolar border*. **C.G.**: anatomical landmarks: external surfaces of the alveolar border (if there are

any exostoses on the margin of the border, the measurement is to be made above them): the maximum transverse diameter is to be measured. [Note by Translator: this description appears to indicate an "external palatine" transverse diameter of the superior maxilla.]

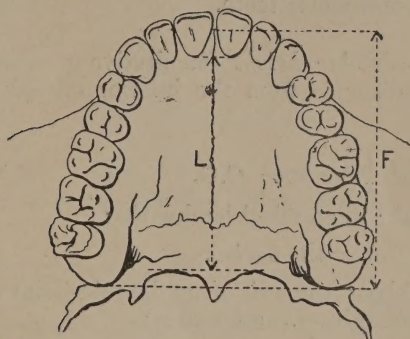


Fig. 4.

18a. *Height of the alveolar curve.* C.G. (*F*, Fig. 4): anatomical landmarks:

- (i) in front: the anterior surface of the alveolar arcade, between the two median incisor teeth.
- (ii) behind: a point in the median plane on a line tangential to the posterior ends of the alveolar margin. This line is easily obtained by thrusting a straight wire deeply into the notch between the tuber maxillare and the palatine bone. [Translator's note: the original text has "pterygoid process" instead of "palate bone," but the latter is anatomically correct. This measurement, and the preceding one (No. 18), give the greatest "external" diameters of the palatine arch.] The maxillo-alveolar index is derived from the expression

$$\frac{\text{Width of the alveolar border} \times 100}{\text{Height of the alveolar curve}}$$

19. *Palatine vault* (facultative measurements). C.G.

(a) *length* (*L*, Fig. 4): anatomical landmarks:

- (i) in front: the point in the middle line and on a line tangential to the posterior surfaces of the median incisor teeth.

- (ii) behind: the point in the middle line, and in a line tangential to the deepest parts of the notches on the posterior palatine border.
- (b) *width*: the distance (measured externally: Translator) between the two alveolar borders at the level of the second molar teeth.

20. *Orbito-alveolar height* (facultative measurement). **C.G.**
The minimum distance from the inferior orbital margin to the alveolar border.

21. *Foramen magnum*. **C.G.**

- (a) *length*: anatomical landmarks:
 - (i) in front: the *basion*.
 - (ii) behind: the *opisthion* (the mid-point of the posterior margin of the foramen).
- (b) *width*: anatomical landmarks: the sides of the foramen: the maximum transverse width is to be measured.

22. *Sagittal cranial arc*. **R.M.**

Extreme points: (i) in front: the *nasion*.

(ii) behind: the *opisthion*.

Intermediate points: the posterior end of the frontal and parietal bones in the median sagittal plane. The whole curve is thus subdivisible into three portions.

23. *Transverse cranial arc*. **R.M.**

- (i) Lateral points: the most prominent point on the posterior root of the zygoma, exactly above the auditory aperture.
- (ii) Intermediate point: the *bregma*.

23a. The "horizontal" curve. **R.M.**: anatomical landmarks:

- (i) in front: *above* the supra-orbital ridges.
- (ii) behind: on the supra-occipital (? interparietal: Translator) part of the occipital bone, so as to measure the greatest circumference, care being taken that the curve be measured in one plane and that it be symmetrical on the opposite sides of the skull.

24. *Cranial capacity.* Without preferring any particular method, though recognizing the particular merits of that known as Broca's method, the Commission recommends that several control-specimens of varying size be reserved and constantly used for the purpose of checking the consistency of procedure. The Commission is of opinion also that where it is possible the method of direct measurement, by using water in an indiarubber bladder, should be employed.

B. *The Mandible.*

25. *Bicondylar width.* **C.G.:** anatomical landmarks: the *external* surface of each condyle, the transverse diameter being measured.

26. *Bigonial diameter.* **C.G.:** anatomical landmarks: the *gonion* on each side (the *gonion* is the point at which the angle is formed between the lower margin of the body of the jaw and the posterior border of its ascending ramus). The measurement is to be made on the external surface of the jaw.

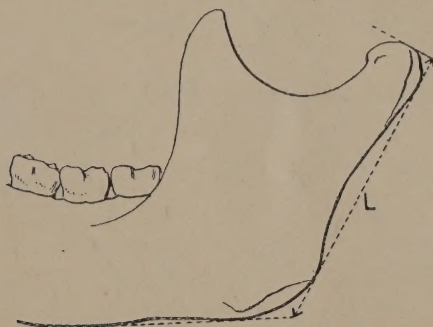


Fig. 5.

27. *Length of the ascending ramus.* **C.G. (L, Fig. 5):** anatomical landmarks:

- (i) above: superior border of the condyle.
- (ii) below: the *gonion*: but since this point is often very difficult to determine, it is recommended to take the point of intersection of the lines representing the lower and posterior surfaces respectively, prolonged till they cut each other. The measurement may be made conveniently by placing the mandible on a

plane surface, and placing the bar of the callipers in contact with the posterior border of the ascending ramus.

28. *Width of the ascending ramus.* **C.G.**

- (a) *minimum width* (m , Fig. 6): minimum width measured from one border to the other.
- (b) *maximum width* (M , Fig. 6) (facultative measurement): anatomical landmarks:
 - (i) in front: the most prominent point on the anterior border of the coronoid process.
 - (ii) behind: the hindmost point on the posterior border of the ascending ramus.

To make this measurement (*b*), place one arm of the callipers in a position tangential to the posterior margin of the ascending ramus, and bring the other arm into contact with the anterior border of the coronoid process.

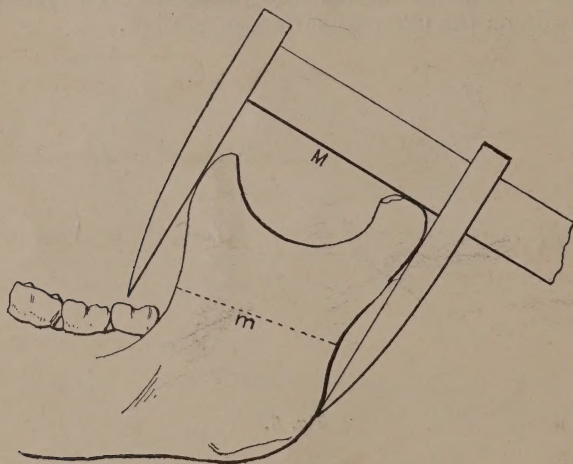


Fig. 6.

29. *Symphysial height.* **C.G.:** anatomical landmarks in the median plane:

- (i) above: the highest point on the alveolar border.
- (ii) below: the inferior margin of the symphysis.

The actual distance (not the distance "in projection") is to be measured.

30. *Height of the body of the mandible.* **C.G.** The procedure is the same as in No. 29 (*q.v.*), but the measurement is made in a vertical plane, passing through the interval between the first and second molar teeth.

31. *Maximum thickness of the body of the mandible.* **C.G.** (facultative measurement). The maximum thickness of the body of the mandible, measured in the plane passing between the first and second molar teeth.

32. *Mandibular angle.* This angle is included by

- (a) the line representing the posterior border of the ascending ramus,
- (b) the line of the lower border of the body of the mandible.

The goniometer of Broca is to be used, and the actual procedure is as described by that author.

II. CEPHALOMETRY.

✓ 1. *Maximum length or maximum antero-posterior diameter of the head.* **C.E.*** Measured as on the skull. Compression to be avoided.

✓ 2. *Maximum width or maximum transverse diameter.* **C.E.** Measured as on the skull.

3. *Height of the head.* Instrument: anthropometric rod: anatomical landmarks:

(i) above: the vertex.

X (ii) below: the upper border of the auditory aperture, the position of which should be carefully checked: it is usually at the bottom of the notch between the tragus and the helix.

✓ 4. *Minimum frontal width.* **C.E.** Procedure as for the skull.

✓ 5. *Maximum bimastoid diameter.* **C.E.** Procedure as for the skull. The observer stands behind the living subject in making this measurement.

* In all measurements made on the head of the living subject with the "compas d'épaisseur," it is indispensable, if a maximum diameter is sought, to bring the callipers into position first, to note the reading, then to remove and clamp the callipers in this position, and lastly to pass the arms (thus fixed) again over the surface of the head for the purpose of verifying the reading first obtained.

6. *Bizygomatic diameter.* **C.E.** Procedure as for the skull. In the living subject, the maximum diameter is often situated further backwards than would be expected.

7. *Bigonial diameter.* **C.E.** Procedure as for the skull. Care must be taken to avoid the masseter muscle.

8. *Total height of the face* (facultative measurement). **C.G.:** anatomical landmarks (both in the median plane of the head):

- (i) above: the roots of the hair on the forehead.
- (ii) below: the lower border of the mandible: slight pressure is to be exerted, in order to exclude the soft tissues as far as possible from contributing to the measurement.

9. *Naso-mental diameter.* **C.G.** Procedure as for the skull, slight upward pressure being exerted at the chin as in the preceding measurement (No. 8). To ascertain the position of the *nasion*, trace the median nasal crest upwards by light pressure with the finger-nail, until the latter meets the slight prominence due to the lower margin of the frontal bone.

10. *Naso-buccal diameter.* **C.G.:** anatomical landmarks (both in the median plane):

- (i) above: the *nasion*.
- (ii) below: the interval between the lips.

11. *Naso-alveolar diameter.* **C.G.** Procedure as for the skull. The *prosthion* or alveolar point can be recognized precisely when the upper lip of the subject is drawn upwards or everted.

12. *Nasal height.* **C.G.:** anatomical landmarks:

- (i) above: the *nasion*.
- (ii) below: the nasal septum, at its union with the upper lip (deep pressure is not to be exerted in making this measurement).

13. *Nasal width.* **C.G.:** anatomical landmarks: the outer surface of the ala of the nose on each side. The maximum width is to be measured without pressure on the nose.

14. *Projection of the base (the lower end: Translator) of the nose* (Fig. 7): anatomical landmarks:

- (i) in front: the tip of the nose.

- (ii) behind: the point at which the median plane is intersected by the line joining the most distant points of the naso-labial folds.

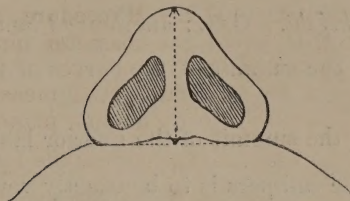


Fig. 7.

This measurement is to be made "in projection," and with an appropriate instrument (not defined by the Commission: Translator).

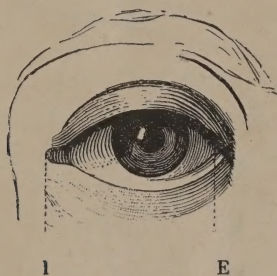


Fig. 8.

15. *External bi-palpebral diameter.* C.G. (*E*, Fig. 8): anatomical landmarks: the external canthus of each palpebral aperture, the deepest part of the cleft being taken where it is in direct contact with the globe of the eye. The subject is to open the eyelids widely, and the axis of vision is to be directed slightly above the horizon. The measurement is then to be made between the two points defined above, the arms of the callipers being supported on the cheeks of the subject.

16. *Internal bi-palpebral diameter.* C.G. (*I*, Fig. 8): anatomical landmarks: the internal canthus of each eye, and internally to the caruncle.

17. *Width of the mouth.* C.G.: anatomical landmarks: the commissures of the lips at the points where the mucous membrane

becomes continuous with the skin. The distance between these points is to be measured when the lips are in the intermediate position.

18. *Bilabial height.* **C.G. :** anatomical landmarks :

- (i) above : the summit of the curves of the superior labial arc.
- (ii) below : the summit of the inferior labial curve.

The stem of the callipers is to be exactly vertical and its arms are to be placed in positions tangential to the summits of the two curves.

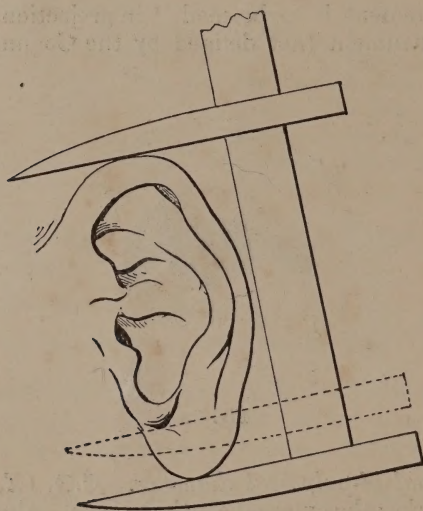


Fig. 9.

19. *The external ear.* **C.G. (Fig. 9, continuous line):**

- (a) *maximum length :* anatomical landmarks :
 - (i) above : the highest point on the edge of the helix.
 - (ii) below : the lowest part of the lobule.

Procedure. The stem of the callipers is to be parallel with the major axis of the auricle, and the arms are to be tangential to the points indicated : pressure is to be avoided.

(b) *length of the cartilaginous portion of the auricle* (Fig. 9, interrupted line): anatomical landmarks:

- (i) above: as for measurement 19 a.
- (ii) below: the inferior border of the cartilaginous concha.

Procedure. The callipers are held in position as in the preceding case (19 a), but the lobule is to be pressed lightly inwards with the lower arm of the callipers, so as to measure the cartilaginous concha only.

- (c) *auricular width*: the distance between two lines parallel to the major axis of the auricle: of these lines, one is tangential to the anterior border of the helix, the second being tangential to its posterior border.

The technique of each of the foregoing measurements was adopted unanimously after discussion.

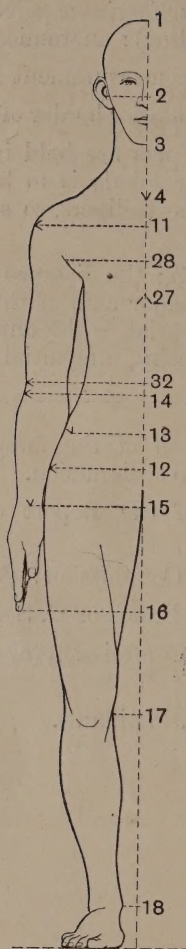
The original text of the Report of the Commission was signed by

The President of the Commission: Professor Waldeyer.

The Vice-President: Professor G. Sergi.

The Members of the Commission (as enumerated in the Introductory note).

The Recorder: Dr G. Papillault.



Outline drawing from the photograph of a living subject. The various levels (viz. Nos. 2, 16, 27, 28) and the exact points (viz. Nos. 3, 4, 11, 12, 13, 14, 15, 17, 18, 32) corresponding to the measurements defined under these heads in the text (pp. 23—25), were marked on the surface of the body before the photograph was taken.

(b)

THE INTERNATIONAL AGREEMENT FOR THE UNIFICATION OF ANTHROPOMETRIC MEASUREMENTS TO BE MADE ON THE LIVING SUBJECT.

I. INTRODUCTION.

DURING the XIVth International Congress of Prehistoric Anthropology and Archaeology, held at Geneva from the 9th to the 12th September, 1912, an International Commission was appointed in order to determine the unification of anthropological measurements to be made on the living subject. The meetings had thus as their object, that of supplementing the work accomplished during the XIIIth Congress, held at Monaco in 1906, when the unification of craniometric and cephalometric measurements was achieved*.

The Commission which met at Geneva included the following members of the Congress:

Messieurs CHANTRE (France).
CZEKANOWSKI (Russia).
DUCKWORTH (Great Britain).
FRASSETTO (Italy).
GIUFFRIDA-RUGGERI (Italy).
GODIN (France).
HILLEBRAND (Hungary).
HOYOS SAINZ (Spain).
HRDLÍČKA (United States).
LOTH (Russian Poland).
VON LUSCHAN (Germany).
MACCURDY (United States).
MANOUVRIER (France).
MARETT (Great Britain).
MAYET (France).
MOCHI (Italy).
MUSGROVE (Great Britain).
PITTARD (Switzerland).
RIVET (France).
SCHLAGINHAUFEN (Switzerland).
G. SERGI (Italy).
SOLLAS (Great Britain).
VOLKOV (Russia).
WEISGERBER (France).

* International Congress of Prehistoric Anthropology and Archaeology, *Compte rendu* of the XIIIth Session, Monaco, 1906, Tome II, pp. 377—394.

The Commission sat on four occasions, as follows:

- | | | |
|----------|---------------------|----------------------------------|
| Sep. 11. | 8 a.m. to mid-day. | President: Professor Manouvrier. |
| Sep. 13. | 8 a.m. to 11 a.m. } | President: Professor G. Sergi. |
| | 3 p.m. to 4 p.m. } | |
| Sep. 14. | 9 a.m. to 10 a.m. | President: Dr Duckworth. |

Messieurs Duckworth, Rivet and Schlaginhaufen were appointed recorders of the proceedings, and were instructed to prepare the report of the Commission.

The full report of the recorders was adopted unanimously by the Commission at the meeting on Sep. 14, and also by the Congress at the concluding meeting on the same day.

II. GENERAL PRINCIPLES.

(a) The *erect position* is adopted as that which the living subject shall assume for the purposes of measurement.

(b) The *method of projection* is adopted in all cases save those in which special mention is made of a different method.

(c) For "*paired*" measurements, the *left* side is recommended; but measurements of both the right and left sides are to be made in the two cases following:

$$\left. \begin{array}{l} \text{height of the acromion} \\ \text{height of the great trochanter} \end{array} \right\} \text{above the ground.}$$

(d) Observers are requested to indicate in every case, with precision, their method and the instruments employed.

(e) Those persons desirous of undertaking anthropometric work are very particularly urged to obtain preliminary *practical* instruction in a laboratory, and not to be content with a merely theoretical study of the various methods and processes of mensuration.

III. DETAILED DEFINITIONS OF THE MEASUREMENTS APPROVED BY THE COMMISSION AND THE CONGRESS.

1. *Stature*: The subject stands erect on a horizontal and resisting plane surface (hereafter spoken of as "the ground"): no support is to be given by a vertical plane: the upper limbs are pendant, the palms of the hands turned inwards, and the fingers pointed vertically downwards, the heels in contact, and the axis of vision horizontal. The height of the vertex above the ground is to be measured in this position.

2. †* *Auditory canal*: anatomical landmark (*point de repère*): the bottom of the notch between the tragus and the helix. (This point had been adopted previously at the Monaco Congress: cf. *op. cit.* p. 391.)

3. * *Chin*: anatomical landmark: the inferior border of the mandible in the median plane.

4. * *Supra-sternal notch*: anatomical landmark: the deepest point in the hollow of the notch.

5. * *Mammilla or Nipple*: anatomical landmark: the centre of the nipple. This measurement is not applicable to women with pendant breasts.

6. * *Umbilicus or Navel*: anatomical landmark: the centre of the umbilical cicatrix.

7. * *Pubes*: anatomical landmark: the upper border of the symphysis pubis in the middle line. Where this point is impalpable, guidance as to its position is given by the cutaneous fold of the lower part of the abdomen in this situation.

8. * *Spinous process of the 5th lumbar vertebra*: to ascertain this anatomical landmark with exactitude, the subject shall be caused to bend forwards from the hips, when the spinous process of the 5th lumbar vertebra will become prominent.

9. *Sitting height*: the subject sits on a horizontal and resisting seat about 30 to 40 ctm. high (this height being proportionate to the stature of the subject): the knees are flexed: the dorsal aspect of the trunk is to make contact with a vertical plane, or with the anthropometric rod at two points, viz. in the sacral region and again between the shoulder-blades. The axis of vision is horizontal, as in No. 1 (*supra*). The height of the vertex above the surface of the seat is to be measured.

10. *Pelvic height*: the subject retains the position adopted for the sitting height (No. 9). The height of the summit of the iliac crest above the surface of the seat is to be measured.

11. * *Acromion*: anatomical landmark: superior and external border of the acromion process.

12. * *Great Trochanter*: anatomical landmark: upper border of the great trochanter.

13. * *Anterior superior iliac spine*: anatomical landmark: the summit of the anterior superior spine of the ilium. In cases of difficulty, the point is found by tracing Poupart's ligament to its iliac termination which defines the point precisely.

† Measurements preceded by an asterisk, thus *, are those in which the subject retains the position already indicated for the measurement of the stature. [In making the measurements 2—8 and 10—18 inclusive the height of the "anatomical landmark" above the ground is to be determined. W. L. H. D.]

14. **Elbow*: anatomical landmark: the radio-humeral articulation.

15. **Wrist*: anatomical landmark: the tip of the styloid process of the radius.

16. **Tip of the middle finger*.

17. **Knee*: anatomical landmark: upper border and edge of the inner tuberosity of the head of the tibia.

18. **Ankle*: anatomical landmark: tip of the internal malleolus.

19. *Span*: the subject is placed against a wall, the arms extended horizontally, the palms of the hands directed forwards. Measure the distance between the tips of the middle fingers of the two hands.

If a wall is not available, the rigid anthropometric rod is to be placed behind the subject, who assumes the position described in the preceding paragraph. The same measurement is to be made.

In either case, the *maximum* span of the subject is to be recorded.

20. **Bi-acromial diameter*: maximum distance between the two acromial points (cf. No. 11).

21. **Bi-humeral diameter*: maximum distance between the two prominences formed by the deltoid muscles. Secondary measurement†.

22. **Bi-mammillary diameter*: distance between the two nipple-points: (cf. note appended to No. 5). Secondary measurement.

23. **Bi-cristal diameter*: maximum distance between the external margins of the iliac crests. In making this measurement, the observer is to direct the arms of the sliding compass obliquely downwards, and from before backwards.

24. **Bi-spinal diameter*: measured between the two anterior superior iliac spines (cf. No. 13 *supra*).

25. **Bi-trochanteric diameter*: maximum distance between the external surfaces of the great trochanters. In making this measurement, the superficial tissues are to be strongly compressed.

26. **External conjugate (antero-posterior) diameter of the pelvis*: anatomical landmarks: in front, the superior margin of the symphysis pubis in the middle line: posteriorly, the tip of the spinous process of the fifth lumbar vertebra.

† Certain measurements are thus described in accordance with the instructions of the Commission.

27†. **Transverse diameter of the thorax* (No. 1). This measurement is to be made in the horizontal plane at the level of the base of the ensiform cartilage. The observer is to record the mean of the measurements taken at the extremes of inspiration and of expiration respectively: alternatively, the measurement may be made in the intermediate stage as regards those two phases of respiration.

28. **Transverse diameter of the thorax* (No. 2). This measurement is to be made in the horizontal plane at the level of the upper border of the fourth chondro-sternal articulation. The same observation (as to the phases of respiration) applies here as to No. 27 *q.v.* Secondary measurement.

29. **Antero-posterior diameter of the thorax* (No. 1). This measurement is to be made in the same horizontal plane as is defined in the case of the transverse diameter of the thorax No. 1 (cf. No. 27). The same observation (as to the phases of respiration) applies to this measurement as to No. 27 *q.v.*

30. **Antero-posterior diameter of the thorax* (No. 2). This measurement is to be made in the same plane as is defined in the case of the transverse diameter of the thorax No. 2 (cf. No. 28). The same observation (as regards the phases of respiration) applies to this measurement as to No. 27 *q.v.* Secondary measurement.

31. **Sternal height*: measured with the sliding callipers: from the supra-sternal notch (cf. No. 4 *supra*) in its deepest part, to the base of the ensiform cartilage.

32. *Bi-condylar diameter of the humerus*. Secondary measurement.

33. *Bi-styloid diameter of the fore-arm*. Secondary measurement.

34. *Bi-condylar diameter of the femur*. Secondary measurement.

35. *Bi-malleolar diameter*. Secondary measurement.

36. **Thoracic circumference*: this circumference is to be measured in the horizontal plane, passing through the base of the ensiform cartilage. The same observation applies here as to No. 27. Secondary measurement.

37. *Circumference of the neck*. Secondary measurement.

† In making measurements Nos. 27 to 30 inclusive, care is to be taken that the extremities of the calliper-arms are wide, since with the ordinary pointed arms there is a danger of error owing to the points slipping on to an intercostal space.

38. *Circumference of the upper arm.* The maximum circumference obtained *below* the insertion of the deltoid muscle, the arm being held in the position of rest.

39. *Circumference of the upper arm* with the biceps muscle in the contracted state. Proceed as in the case of No. 38. Secondary measurement.

40. *Maximum circumference of the fore-arm.* This measurement is to be made in the region of the epitrochlear and epicondylar muscles, i.e. immediately below the joint-level.

41. *Minimum circumference of the fore-arm.* This measurement is to be made above the level of the styloid processes of the radius and ulna.

42. *Maximum circumference of the thigh.* This measurement is to be made at the level of the gluteal fold.

43. *Minimum circumference of the thigh:* measured above the level of the knee-joint.

44. *Circumference of the calf of the leg:* the maximum value.

45. *Minimum circumference of the leg.* This measurement is to be made above the level of the malleoli.

46. *Minimum circumference of the waist.* This measurement is to be made at the level of the most constricted portion of the abdomen.

47. *Contour of the hand.* The right hand is applied to a sheet of paper, the fingers being very slightly separated, and the axis of the middle-finger forming a prolongation of that of the fore-arm. The two ends of the bi-styloid line are to be marked by pencil dots. Starting from these points the contour of the palm and fingers is to be traced with a pencil split longitudinally and held vertically. Special dots are to be added, marking (a) the extreme ends of the interdigital clefts, and (b) on each side, the position of the metacarpo-phalangeal articulations.

48. *Contour of the foot.* The right foot rests on a sheet of paper, the leg being perpendicular to the plane of this surface. Draw four short lines to mark the positions of the ends of the malleoli, and of the metatarso-phalangeal articulation of each side. Then the contour of the foot is to be traced in the same way as described for the hand (cf. No. 47). The extreme end of each interdigital cleft is to be marked by a dot. It is useless to trace the inner border of the foot between the malleolar point and the metatarso-phalangeal point, for this part of the tracing is always unreliable.

49. *Height of the plantar arch.* The foot being placed in the position requisite for tracing its contour (cf. No. 48), the vertical distance is to be measured between the plane of support and the upper border of the navicular bone. Secondary measurement.

IV. ADDITIONAL RESOLUTIONS.

The Commission and the Congress also adopted unanimously the following proposal and resolutions:

(a) *For the reconstruction of the stature from observations on the long bones of the skeleton.*

For the reconstruction of the stature with the aid of the long bones, the maximum length shall be measured in all cases save in those of the femur which is to be measured in the oblique position, and the tibia which is also to be measured in the oblique position, the spine being excluded.

(b) The Commission wishes to state that it is desirable that in the graphic representation of cranial forms, either the plane of Broca or of the Frankfort Agreement should be employed by anthropologists.

(c) The Commission holds that it is desirable that anthropologists should append complete lists of measurements to their publications.

(Signed) W. L. H. DUCKWORTH

*(One of the Recorders of the
International Commission).*

Oct. 30, 1912.

(c)

APPENDIX (BY THE TRANSLATOR).

The publication of the foregoing translation of the International Agreements for the Unification of Anthropometric measurements, calls for some remark on the relation of this scheme to that published in 1908 by the British Association Committee for Anthropometric Investigation in the British Isles (cf. Report of the British Association, Dublin, 1908, pp. 351 ff.: published also as a separate pamphlet by the Royal Anthropological Institute, London, 1909). The Translator was a member of that Committee.

While it is not considered necessary to give in this place a complete analysis of the several points of agreement and contrast, the following note will serve as a summary of these.

- I. The International Agreement (1906) treats of craniometric and cephalometric measurements in separate sections (cf. pp. 7 and 15 *supra*). This distinction is not definitely drawn in the British Association Report, which deals primarily with cephalometry.
- II. The International Agreement (1906) defines forty measurements of the cranium, and twenty-one of the head, making a total of sixty-one measurements. The British Association Report defines thirty-seven measurements of the head.
- III. Measurements of the head :
 - (a) Number of measurements defined in the International Agreement (1906) but not in the Report of the British Association Committee (1908).....5
(viz. Nos. 5, 8, 10, 17, 18, cf. pp. 15—19 *supra*).
 - (b) Number of measurements comparable in the two schemes16
 - (i) Identical in the two schemes13
(viz. Nos. 1, 2, 4, 6, 7, 9, 11, 12, 13, 14, 15, 16, 19a).
 - (ii) Nearly identical1
(viz. No. 19 b).
 - (iii) Distinct as regards definition in the two schemes.....2
(viz. Nos. 3, 19 c).

IV. Measurements of the whole body and of the limbs :

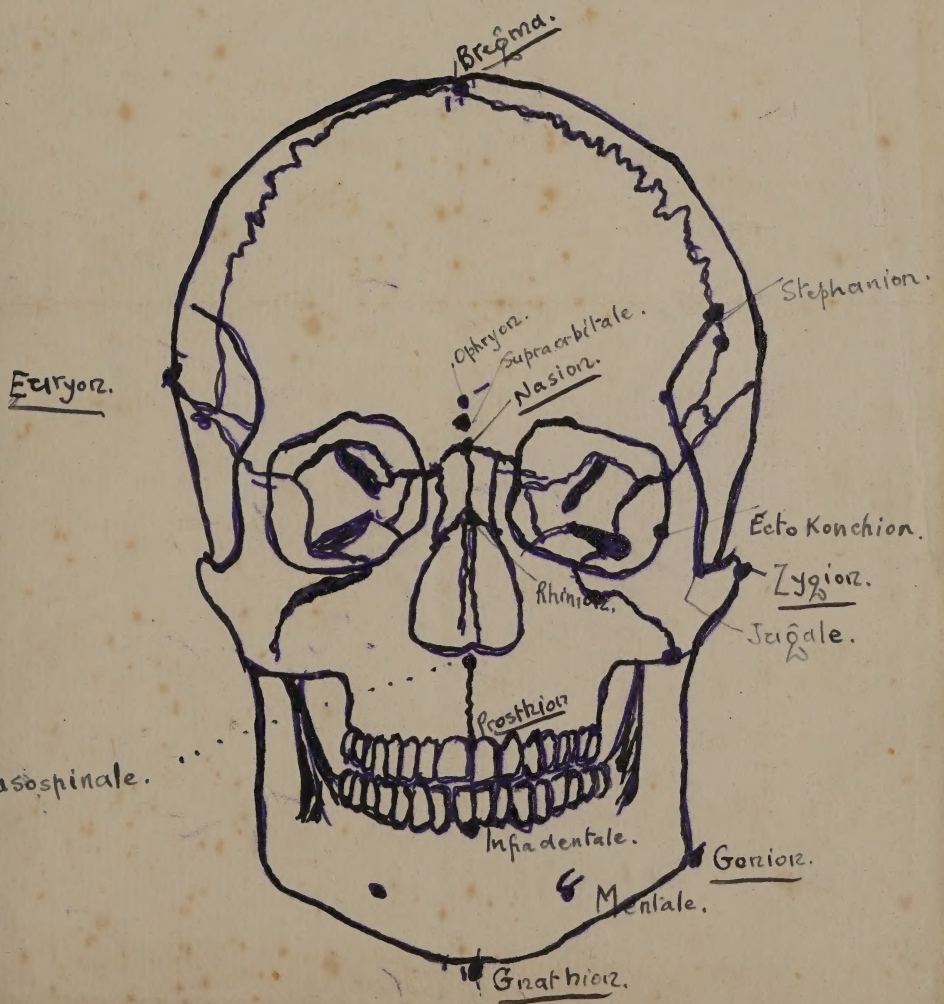
- (a) Number of measurements defined in the International Agreement (1912) but not in the Report of the British Association Committee (1908)22
 (viz. Nos. 3, 5, 6, 8, 10, 13, 22, 27, 29, 31, 32, 33, 34, 35, 37, 39, 41, 43, 45, 46, 47, 49).
- (b) Number of measurements comparable in the two schemes27
- (i) Identical in the two schemes18
 (viz. Nos. 1, 4, 7, 9, 11, 12, 14, 15, 18, 20, 21, 24, 25, 28, 30, 38, 40, 44).
- (ii) Nearly identical in the two schemes.....9
 (viz. Nos. 2, 16, 17, 19, 23, 26, 36, 42, 48).

V. From the foregoing comparisons it appears that where the two schemes (International and British) define sixteen comparable measurements for the head, the definitions coincide in thirteen instances. And as regards the body taken as a whole, the number of comparable measurements is twenty-seven of which number eighteen are identical in the two schemes.

VI. In many instances where differences in procedure exist, these are not profound. But special note should be made of the difference in method as regards the measurement of the *height* of the head (cf. Section III, (b) (iii) of Appendix).

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